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CHRONOLOGICAL DEVELOPMENT OF THE KRASNOYARSK SOLID PROPELLANT ROCKET MOTOR TEST AND PRODUCTION FACILITIES KRASNOYARSK, USSR FEBRUARY 1967

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CHRONOLOGICAL DEVELOPMENT OF THE KRASNOYARSK SOLID PROPELLANT ROCKET MOTOR TEST AND PRODUCTION FACILITIES, KRASNOYARSK, USSR FEBRUARY 1967

The Krasnoyarsk Solid Propellant Rocket Motor Test Facility and the adjacent propellants production plants are located at 56-02N 093-03E, on the eastern edge of Krasnoyarsk, USSR (Figure 1). The testing and production facilities are associated with and are a part of a probably pre-existing explosives complex, Explosives Plant Zlobino [redacted] The facilities are situated about 5 nautical miles east of Krasnoyarsk Airfield.

For the purposes of this chronological study, these facilities have been divided into 3 parts: the Test Facility, including 2 sets of "offset" or temperature conditioning/curing buildings; the Double-Base Propellant Plant; and the Probable Single-Base Propellant Plant, including a small munitions storage area. The latter plant probably incorporates facilities for loading munitions and possibly includes a capability for manufacturing black powder. The boundaries of these 3 parts are indicated on Figure 2. The area of the production facilities believed to be involved in manufacturing solid propellants is listed in the Bombing Encyclopedia as Krasnoyarsk Solid Motor Production Plant [redacted] this area would correspond to the Double-Base Propellant Plant as described in this study.

Three other industrial plants which are not described in this report are located in the immediate vicinity and may have a functional relationship with the propellants testing and production facilities. In the following listing of these 3 plants, the potentially related products that each could supply are indicated within parentheses ( ) following the general description: Krasnoyarsk Hydrolysis Plant, [redacted] wood products (cellulose and alcohol); Krasnoyarsk Synthetic Rubber Plant, [redacted] (binder/fuel for composite propellant formulations); and Krasnoyarsk Armaments Plant Voroshilov No 4, BE No [redacted] (hardware).

This report presents a chronological study of the development of the propellants testing and production facilities. The study is limited, however, by the time period during which photography has been obtained and the interpretability of the available photography. A majority of the structures in the 2 production plants and a number of those in the testing facility were constructed prior to the earliest photography, that of [redacted] The available photography from [redacted] was small scale and of only limited interpretability; the most recent photography, obtained on [redacted] is medium scale and provides fair interpretability.

Line drawings of the Test Facility (Figure 3) and the 2 plants (Figures 5 and 6) use a color code to indicate the construction chronology of most of the structures in the 3 parts. Tables keyed to the line drawings present dimensions, roof coverage, functional interpretation, and other relevant data for all major structures in the facilities. Steamlines and rail spurs have not been included in the chronological development because gaps in the photographic coverage and the lack of sufficiently high-quality photography have not permitted an analysis of these items. Perspective views and detailed dimensions of the 2 test cells and the principal checkout-assembly building are presented in Figure 4.

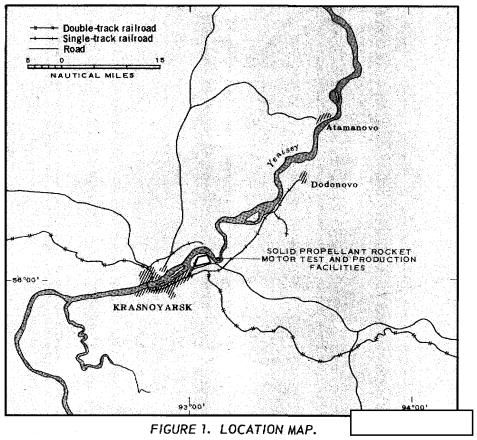

FIGURE 1. LOCATION MAP.

A comparison of the Double-Base Propellant and the Probable Single-Base Propellant Plants revealed that practically all of the post-1961 construction has taken place in the Double-Base Propellant Plant area. The most significant structures are the 2 mixing and casting buildings (items 36 and 37, Figure 5) which were built or were under construction in 1962 and the several large probable motor storage/curing buildings (items 1, 2, 3, 7, 8, and 9, Figure 5) which were constructed during the 1962-64 time period. Two sets of offset buildings adjacent to the Test Facility (items 11 and 12, Figure 3) were built during the same time period. This construction schedule suggests a functional relationship between the expanded Double-Base Propellant Plant with its specialized facilities, the offset buildings which are thought to be temperature conditioning/curing facilities for solid rocket motors, and the Test Facility, where construction has also been evident during the 1962-64 time period.

It is possible that the Probable Single-Base Propellant Plant antedates the other facilities at this site and that it may have been the original propellant plant, manufacturing conventional propellants for small-arms munitions, artillery shells, and similar items.

No evidence of test activity or items of solid rocket motor hardware have been observed as yet at the Krasnoyarsk facilities.

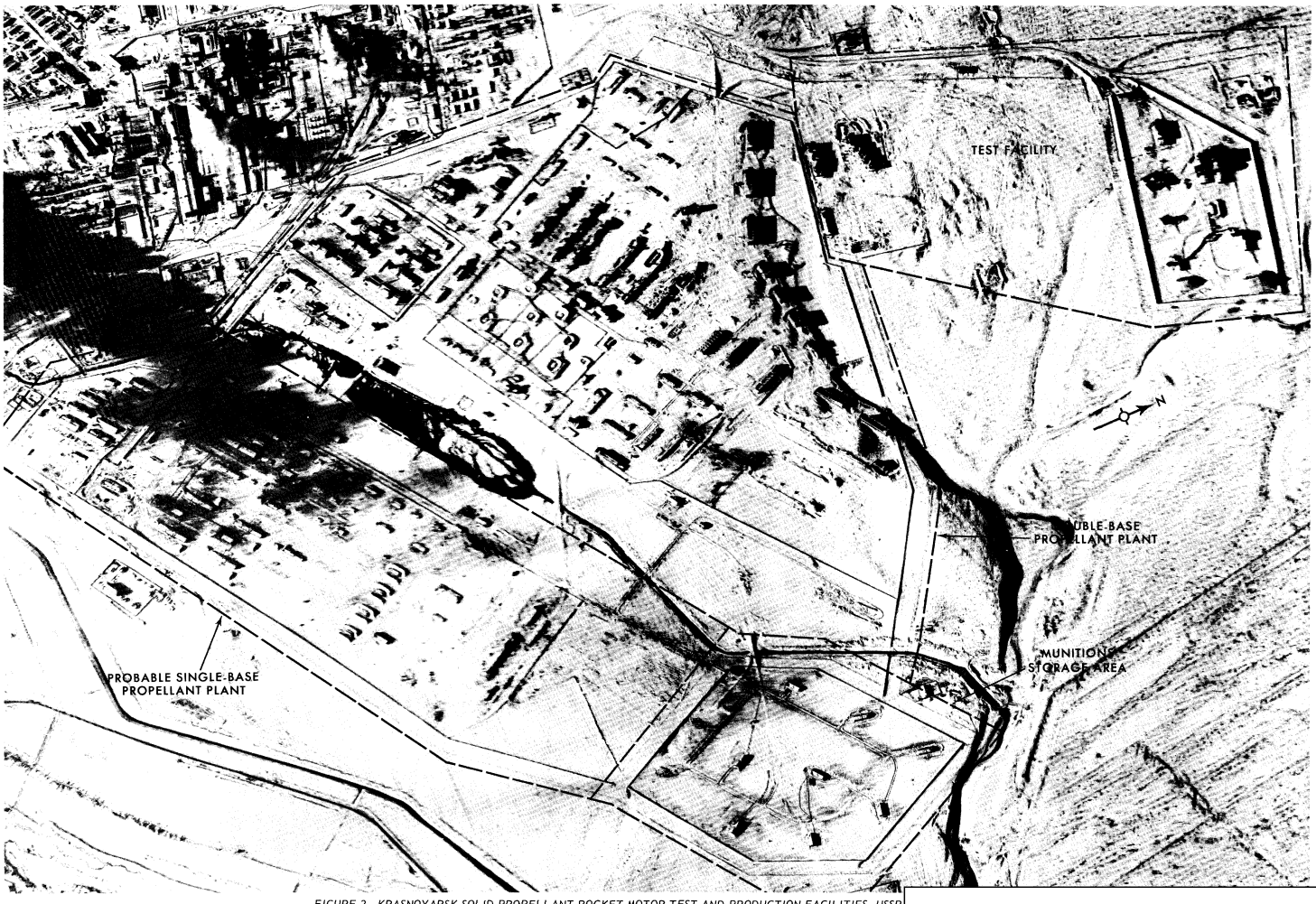

FIGURE 2. KRASNOYARSK SOLID PROPELLANT ROCKET MOTOR TEST AND PRODUCTION FACILITIES, USSR

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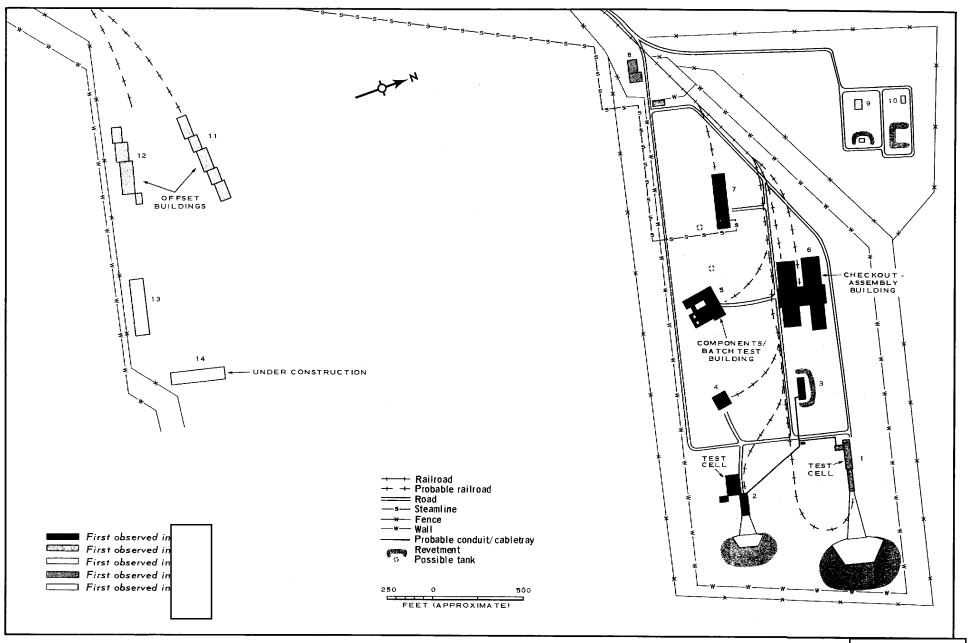

FIGURE 3. LAYOUT OF THE TEST FACILITY.

Table 1. Functions, Dimensions, and Chronology of Structures in the Test Facility (Item numbers are keyed to Figure 3)

Item	Function	Dimensions* Length (ft)	Width (ft)	Roof Cover (sq ft)	First Observed**	Explanatory Notes
1	Motor test cell					Bldg dimensions are shown on Fig 4
2	Motor test cell					Bldg dimensions are shown on Fig 4
3	Test support/control					Revetted; connected to items 1 & 2 by overhead prob conduits/ cabletrays
4	Test support					
5	Components/batch test					
6	Checkout-assembly					May have been u/c [redacted] poss quality control/small motor test bldg Prob u/c [redacted] tallest section approx 80 ft high; bldg dimensions are shown on Fig 4
7	Test support					
8	Engineering/test office					
9	Prob sensitive components storage					
10	Prob sensitive components storage					
11	Temperature conditioning/curing (offset)					Items 11 & 12 u/c [redacted] both prob are or will be served by multiple rail spurs
12	Temperature conditioning/curing (offset)					
13	Prob motor storage					Dimensions estimated
14	Prob motor storage, u/c					Dimensions estimated; u/c [redacted]

*Linear dimensions are accurate to within ±10 ft or 10%, whichever is greater.
**Completion dates are not included because of time gaps and quality variations in the photography. Unless otherwise stated in the column entitled Explanatory Notes, structures generally may be considered apparently complete in the year given.

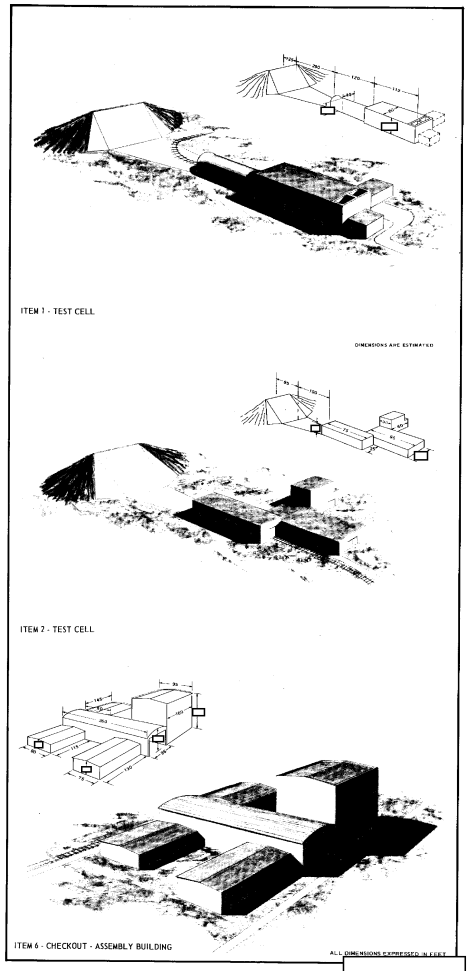

FIGURE 4. PERSPECTIVE VIEWS AND DIMENSIONS OF MOTOR TEST CELLS AND CHECKOUT-ASSEMBLY BUILDING (items 1, 2, and 6, Figure 3).

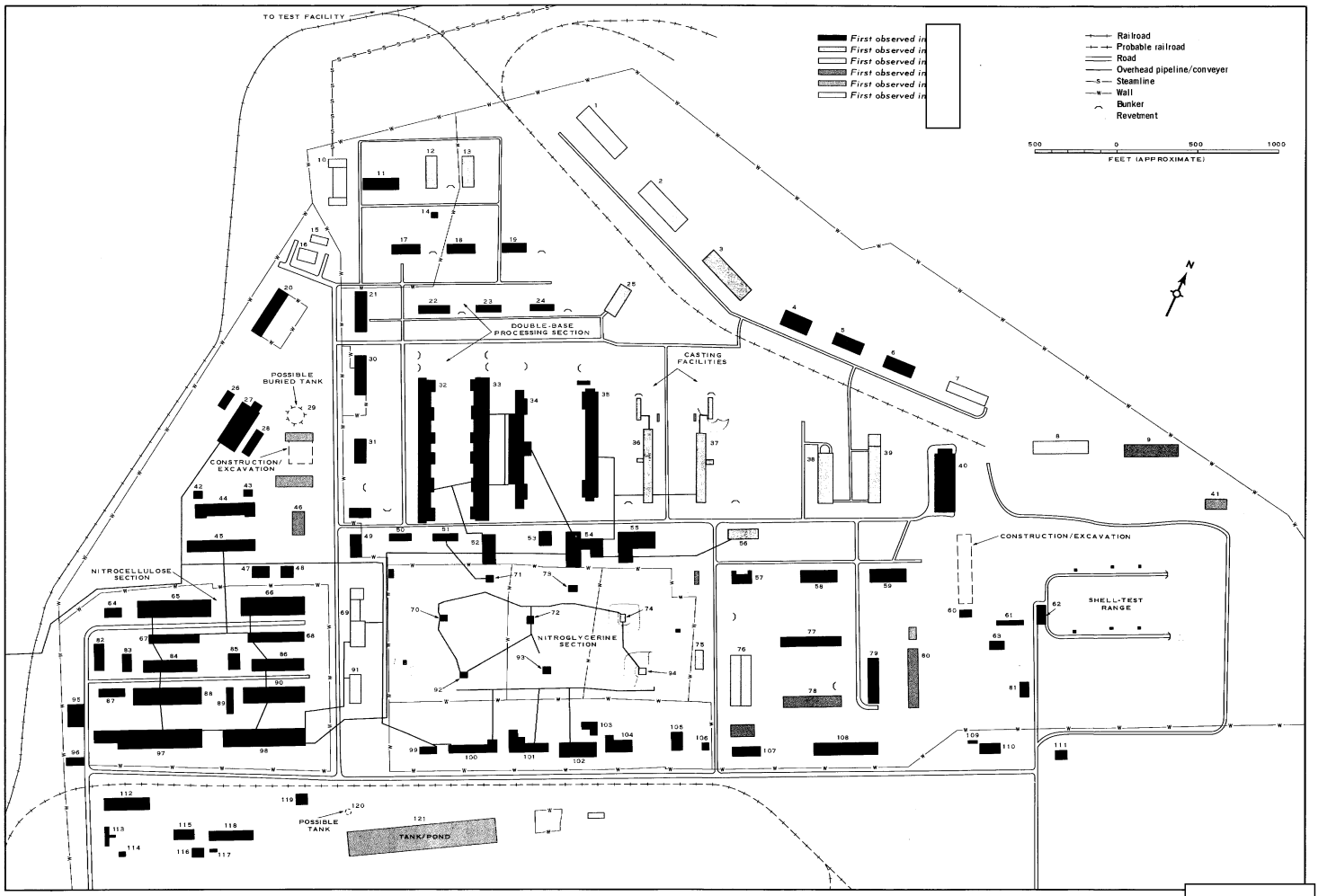

FIGURE 5. LAYOUT OF THE DOUBLE-BASE PROPELLANT PLANT.

Table 2. Functions, Dimensions, and Chronology of Structures in the Double-Base Propellant Plant
(Item numbers are keyed to Figure 5)

Item	Function	Explanatory Notes
1	Prob motor storage/curing	Some or all of items 1 through 9 may be used for assembly as well as for storage
2	Prob motor storage/curing	See note, item 1
3	Prob motor storage/curing	See note, item 1
4	Motor storage/curing	See note, item 1
5	Motor storage/curing	See note, item 1
6	Motor storage/curing	See note, item 1
7	Prob motor storage/curing	See note, item 1
8	Prob motor storage/curing	See note, item 1; bldg u/c [redacted]
9	Prob motor storage/curing	See note, item 1
10	DB processing/storage***	
11	DB processing/storage	May have been present [redacted]
12	DB processing/storage	May have been present [redacted] both shape and dimensions estimated
13	DB processing/storage	
14	Support	Prob bldg
15	U/I	
16	U/I	
17	DB processing/storage	
18	DB processing/storage	
19	DB processing/storage	
20	Storage	
21	DB processing	
22	DB processing/storage	
23	DB processing/storage	
24	DB processing/storage	
25	U/I	
26	NC processing/acid processing***	Poss present [redacted]
27	NC processing/acid processing	Poss present
28	NC processing/acid processing	Poss present
29	Liquid storage	Poss buried tank
30	DB processing	
31	DB processing	
32	DB processing	Poss u/c [redacted] shape and dimensions generalized
33	DB processing	Shape and dimensions generalized
34	DB processing	Shape and dimensions generalized; prob u/c [redacted] high section at each end
35	DB processing	Shape and dimensions generalized; prob u/c [redacted]
36	Mixing & casting	Shape and dimensions generalized; prob casting bldg at N end is [redacted] and revetted
37	Mixing & casting	Shape and dimensions generalized; u/c [redacted] prob casting bldg at N end is [redacted] and revetted
38	DB processing/loading	
39	DB processing/loading	
40	DB processing/loading	
41	U/I	
42	Prob NC processing	
43	Prob NC processing	
44	Prob NC/nitric acid processing	Items 44 & 45 may be 1 complex structure constituting a cellulosenitration facility
45	Prob NC processing	
46	Prob NC processing	
47	Prob NC processing/support	Poss present [redacted] may be connected to item 48
48	Prob NC processing/support	Poss present [redacted]
49	Poss office	Unnumbered bldg immediately N of item 49 is [redacted]
50	Prob NG/NC processing***	
51	Prob NG/NC processing	
52	Prob NG/NC processing	
53	Prob NG/NC processing	
54	Prob NG/NC processing	
55	Prob NG/NC processing	
56	Poss storage	Poss present [redacted]
57	Poss storage	
58	Loading/storage	
59	Loading/storage	
60	Support	Items 60 through 63 may support shell-test range
61	Support	See note, item 60
62	Support	See note, item 60; prob shell-test control bldg
63	Support	See note, item 60
64	NC processing	
65	NC processing	
66	NC processing	Poss present 1961
67	NC processing	
68	NC processing	
69	NC processing	
70	NG processing	Heavily revetted
71	NG processing	Heavily revetted
72	NG processing	Heavily revetted
73	NG processing	Heavily revetted
74	U/I	Poss present [redacted]
75	U/I	Poss present [redacted]
76	Poss munitions loading	Excavation/foundations evident [redacted]
77	Poss munitions loading	
78	Poss munitions loading	Early stage of construction [redacted]
79	Poss munitions loading	
80	Poss munitions loading	[redacted]
81	Test range support	
82	NC processing	
83	NC processing	
84	NC processing	
85	NC processing	
86	NC processing	
87	NC processing	
88	NC processing	
89	NC processing	
90	NC processing	
91	NC processing	
92	NG processing	Prob nitrator; prob blew up prior [redacted] rebuilt
93	NG processing	Prob nitrator
94	U/I	Revetted; part of a third NG line apparently complete [redacted]
95	Support/admin	
96	Support/admin	
97	NC processing	
98	NC processing	
99	NG processing	Items 99 through 104 poss include glycorine storage and poss heating & acid handling facilities
100	NG processing	See note, item 99
101	NG processing	See note, item 99
102	NG processing	See note, item 99
103	NG processing	See note, item 99
104	NG processing	See note, item 99
105	U/I	
106	U/I	
107	Poss munitions processing	
108	Poss munitions processing	
109	U/I	Prob present [redacted]
110	U/I	Prob present [redacted]
111	U/I	Poss present [redacted]
112	Admin/laboratory	
113	Admin	
114	Admin/support	
115	Poss laboratory	
116	Poss laboratory/engineering	Poss present [redacted]
117	U/I	Poss present [redacted]
118	Poss laboratory/processing	
119	Poss NC processing support	May house 1 or more tanks; poss present [redacted]
120	Poss tank	Poss water reservoir/cooling pond/ test tank
121	Tank/pond	

*Linear dimensions are accurate to within ±10 ft or 10%, whichever is greater.
**Completion dates are not included because of time gaps and quality variations in the photography. Unless otherwise stated in the column entitled Explanatory Notes, structures generally may be considered apparently complete in the year given.

***Abbreviations used in this table:
DB - double-base propellant, conventional and/or rocket motor
NC - nitrocellulose
NG - nitroglycerine

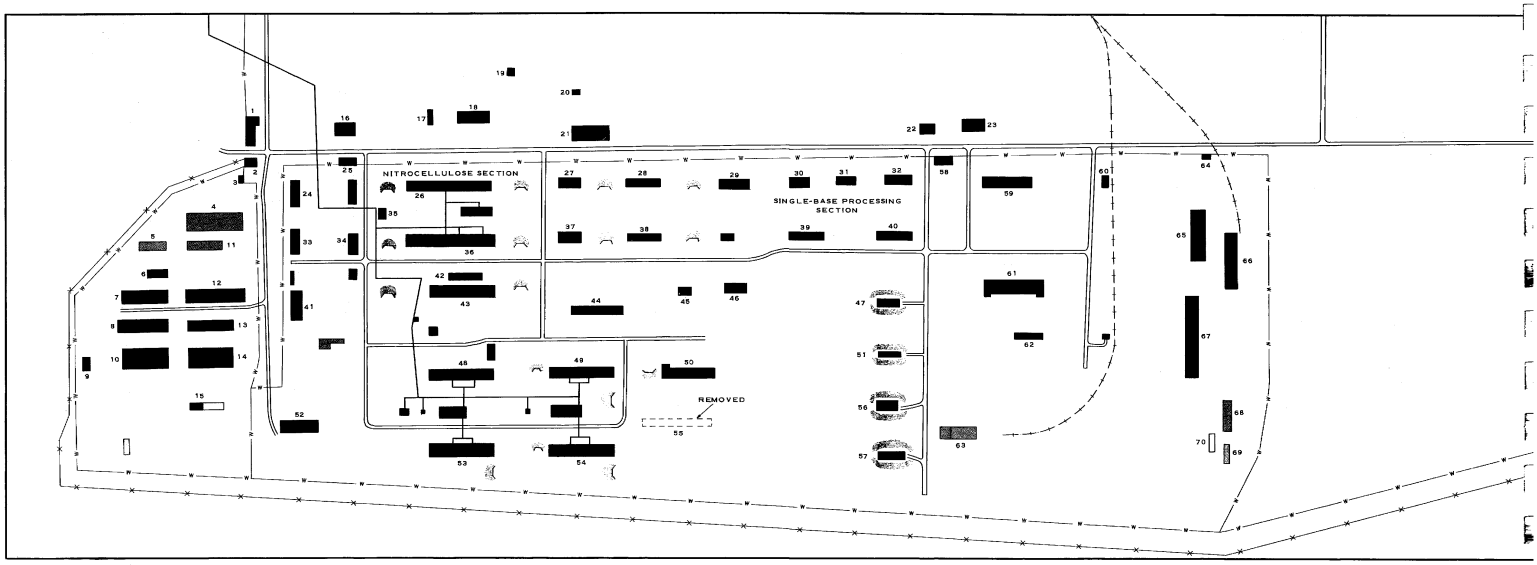

FIGURE 6. LAYOUT OF THE PROBABLE SINGLE-BASE PROPELLANT PLANT AND MUNITIONS STORAGE AREA.

Table 3. Functions, Dimensions, and Chronology of Structures in the Probable Single-Base Propellant Plant and the Munitions Storage Area
(Item numbers are keyed to Figure 6)

Item	Functions	Dimensions* Length (ft)	Width (ft)	Roof Cover (sq ft)	First Observed**	Explanatory Notes
1	Admin					
2	Admin					
3	Support					May have been present [redacted]
4	Warehouse/shop					Items 4 through 14 originally may have been a NC*** processing section
5	Warehouse/shop					See note, item 4
6	Warehouse/shop					See note, item 4
7	Warehouse/shop					See note, item 4
8	Warehouse/shop					See note, item 4
9	Support					See note, item 4
10	Warehouse/shop					See note, item 4
11	Warehouse/shop					See note, item 4
12	Warehouse/shop					See note, item 4
13	Warehouse/shop					See note, item 4
14	Warehouse/shop					See note, item 4
15	Support					Poss present [redacted]
16	U/I SB support***					Items 16 through 23 may include solvent processing, labs, and offices
17	U/I SB support					See note, item 16
18	U/I SB support					See note, item 16
19	U/I SB support					See note, item 16
20	U/I SB support					See note, item 16
21	U/I SB support					See note, item 16
22	U/I SB support					See note, item 16
23	U/I SB support					See note, item 16
24	Poss SB processing					
25	Poss SB processing					
26	Prob SB processing					
27	Poss SB processing					
28	Poss SB processing					
29	Poss SB processing					
30	Poss SB processing					
31	Poss SB processing					
32	Poss SB processing					
33	Poss SB processing					
34	Poss SB processing					
35	Poss SB processing					
36	Prob SB processing					
37	Poss SB processing					
38	Poss SB processing					
39	Poss SB processing					
40	Poss SB processing					
41	Poss SB processing					
42	Prob SB processing					
43	Prob SB processing					
44	Prob SB processing					
45	Poss SB processing					
46	Poss SB processing					
47	Poss SB processing					Heavily revetted; poss munitions loading facility
48	Prob SB processing					
49	Prob SB processing					
50	Prob SB processing					
51	Poss SB processing					Heavily revetted; poss munitions loading facility
52	Poss SB processing					
53	Prob SB processing					
54	Prob SB processing					
55	Poss SB processing					No longer present [redacted]

*Linear dimensions are accurate to within ±10 ft or 10%, whichever is greater.

**Completion dates are not included because of time gaps and quality variations in the photography. Unless otherwise stated in the column entitled Explanatory Notes, structures generally may be considered apparently complete in the year given.

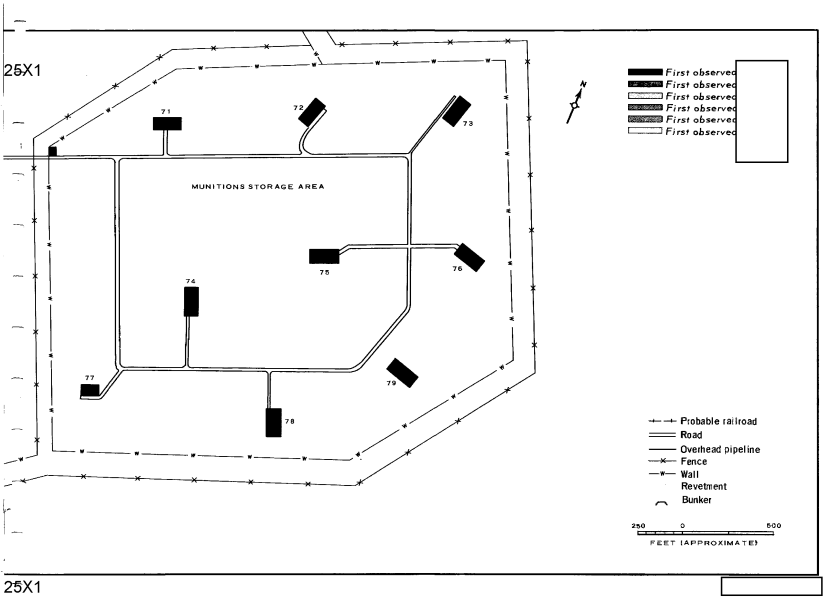

Table 3. (Continued)

Item	Function	Dimensions* Length (ft)	Width (ft)	Roof Cover (sq ft)	First Observed**	Explanatory Notes
56	Poss SB processing					Heavily revetted; poss munitions loading facility
57	Poss SB processing					Heavily revetted; poss munitions loading facility
58	Gatehouse/office					
59	U/I					
60	U/I					
61	U/I					
62	U/I					
63	U/I					
64	Gate/guardhouse/office					
65	Poss ship/pack facility					Items 65 through 67: poss u/c [redacted] could also be munitions fabrication/ loading facilities
66	Poss ship/pack facility					See note, item 65
67	Poss ship/pack facility					See note, item 65
68	Prob warehouse					
69	Prob warehouse					
70	Prob warehouse					
71	Munitions/explosives storage					
72	Munitions/explosives storage					
73	Munitions/explosives storage					
74	Munitions/explosives storage					
75	Munitions/explosives storage					
76	Munitions/explosives storage					
77	Munitions/explosives storage					
78	Munitions/explosives storage					
79	Munitions/explosives storage					

***Abbreviations used in this table:
NC - nitrocellulose
SB - single-base propellant

[redacted]

MAPS OR CHARTS

ACIC series, scale 1:200,000

REQUIREMENT

CIA. C-DI5-82,973

NPIC PROJECT

11212/66 (partial answer)